



Section 3

Bridge Scour Evaluation Webinar

Requirements for Scour Documentation

Chun Ho Lee, P.E.

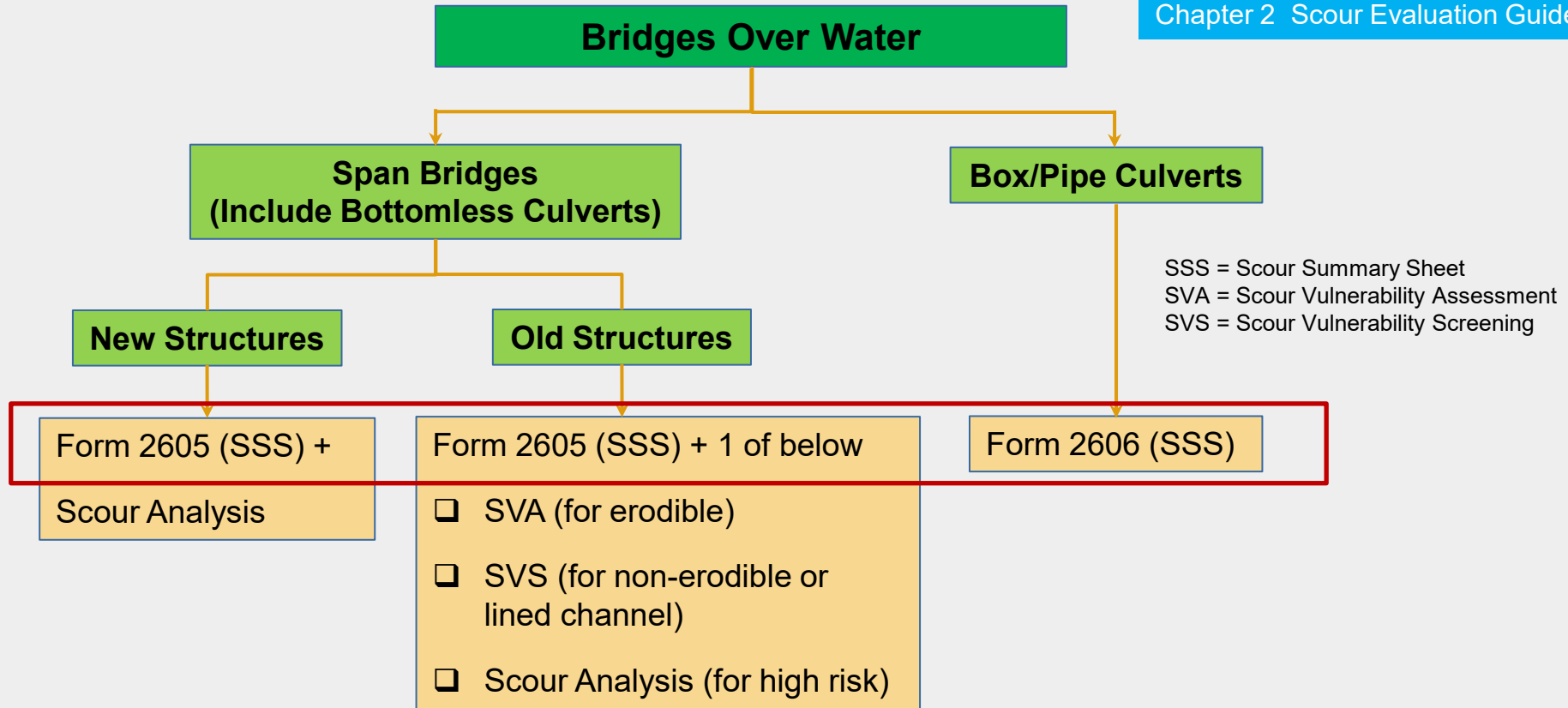
March 25, 2024



1	Current TxDOT Documentation for Scour	3-29
	→ Useful Content in a Scour Document	6-16
	→ Supporting Documents	17-29
3	Updating Superseded Scour Documentation	30-34
4	Storing, Updating, and Tracking of Scour Documentation	35-48



Current TxDOT Scour Documentation



SSS = Scour Summary Sheet
SVA = Scour Vulnerability Assessment
SVS = Scour Vulnerability Screening

Requirements for Scour Documentation



**Bottomless
Culverts are
Span Bridges**



**Box/Pipe Culvert
(Use Form 2606 Only)**



**Bridge Class Culverts
Item 61 ≠ N**



Useful Content in a Scour Document



Scour documentation should provide useful scour related information supporting the current scour coding and inspection:

- Engineer's seal and signature
- Identified scour evaluation method and supporting document
- Foundation information
- Other channel or countermeasure details that relate to the scour coding
- Observed or calculated scour depths compared to the allowable scour depth
- Trigger elevations and conditions for re-evaluation

Requirements for Scour Documentation



Example: Current Scour Summary Sheet

Scour Summary Sheet for Span Bridges

Form 2605
(Rev. 03/24)
Page 1 of 2

DISTRICT: COUNTY: NBI#:

FEATURE CARRIED: FEATURE CROSSED: CSJ:

Recommended Scour Coding(s)

NBI CODINGS		
Item	Description	Coding
Item 113	Scour Critical Bridges	<input type="checkbox"/>
Item 113.1	Scour Plans of Action	<input type="checkbox"/>
Item 113.2	Unknown Foundations	<input type="checkbox"/>

SNBI CODINGS		
Item	Description	Coding
B.C.11	Scour Condition (Observed Scour Only)	<input type="checkbox"/>
B.AP.03	Scour Vulnerability	<input type="checkbox"/>
B.AP.04	Scour Plan of Action	<input type="checkbox"/>
B.AP.03.1	Unknown Foundations	<input type="checkbox"/>

Engineer of Record for the Recommended Scour Coding(s):

Date of Recommendation:

Seal, Signature, and Date

Warning: JavaScript Window - Item 113 Scour Critical Bridges

- 0 - Bridge is not over waterway.
- 1 - Unknown foundation and lacking scour evaluation and/or documentation.
- 2 - Over tidal waters and lacking scour evaluation and/or documentation.
- 3 - All foundation components, including piles or shafts, are above flood waters.
- 4 - The calculated scour depth (if applicable) would cause minimal foundation exposure. The observed scour depth has caused minimal foundation exposure.
- 5 - Previously observed scour has been remediated; countermeasures have been installed and are performing well.
- 6 - Lacking scour evaluation and/or documentation.
- 7 - The calculated scour depth would cause moderate foundation exposure. The observed scour depth causes minimal foundation exposure.
- 8 - The observed scour has caused moderate foundation exposure. The calculated scour would cause minimal or moderate foundation exposure. Action is required to address the observed scour.
- 9 - The calculated scour depth would cause major foundation exposure. The observed scour has caused minimal or moderate foundation exposure. A Bridge Scour Plan of Action (Form 2604) is required.
- 10 - Observed scour has caused major foundation exposure. Immediate action is required to remediate the observed scour. A Bridge Scour Plan of Action (Form 2604) is required.
- 11 - Observed scour exceeds the max allowable scour depth. Failure is imminent and the bridge is closed to traffic. A Bridge Scour Plan of Action (Form 2604) is required.
- 12 - Failure has occurred, and the bridge is closed to traffic.

OK

- Fill out all necessary fields
- ✓ Basic bridge information
- ✓ Scour coding results from an evaluation
- ✓ EOR's name
- ✓ EOR seal and signature



Example: Current Scour Summary Sheet

Scour Evaluation Method

SCOUR EVALUATION DETAILS	
Date of Scour Evaluation:	<input type="text"/>
Engineer of Record for Scour Evaluation:	<input type="text"/>
Scour Evaluation Method	<input type="checkbox"/> Detailed Hydraulic Analysis (indicate method below) <input type="text"/>
	<input type="checkbox"/> Scour Vulnerability Assessment (Form 537)
	<input type="checkbox"/> Scour Vulnerability Screening (Form 538)
	<input type="checkbox"/> Other: <input type="text"/>

Type of Scour Analysis

<input type="text"/>
Traditional HEC-18
FDOT Pier Scour
SRICOS
HEC-18 Reduction (for clayey soils)
Annandale's Erodibility Index
Other (specify below):



Example: Current Scour Summary Sheet

Foundation Details

FOUNDATION DETAILS

The foundation is protected by a non-erodible stratum. (Describe below)

Refer to Chapter 7 of the TxDOT Scour Evaluation Guide.

List any foundation assumption below:

DO NOT DISCLOSE - INFORMATION CONFIDENTIAL UNDER THE TEXAS HOMELAND SECURITY ACTION AND SECTION 23 USC SECTION 409, SAFETY SENSITIVE INFORMATION

Form 2605
(Rev. 03/24)
Page 2 of 2

UNKNOWN FOUNDATION DETAILS

List any foundation assumption below:

Refer to Chapter 6 of the TxDOT Scour Evaluation Guide.

Plan of Action for Unknown Foundation:

Estimated Time of Completion:

List any foundation assumptions:

- Design disregard depth (e.g. calculated scour depths and other geotechnical conservatism)
- Assumed foundation depth for unknown foundation
- Plan of action for unknown foundation

Plan of Action for Unknown Foundation:

Estimated Time of Completion:

1. Perform Evaluation using Assumed Approach
2. Perform NDE (Non-Destructive Evaluation)
3. Request as-built foundation plan
4. Provide Designed Countermeasure
5. Other (Specify Below):



Example: Current Scour Summary Sheet

Inspection Details

INSPECTION DETAILS	
Date of Most Recent Inspection: <input type="text"/>	B.C.10 Channel Protection Rating: <input type="text"/>
Scour Countermeasure Condition (select one): <input type="text"/>	

Input

- ✓ Scour evaluation based on latest inspection
- ✓ Countermeasure condition
- ✓ Channel condition

Scour Countermeasure Condition (select one):	<input type="text"/>
	Designed and functioning countermeasure installed
	Temporary (not designed) Installed
	Temporary (not designed) Installed & functioning
	No Countermeasure installed
	Other (describe below):



Example: Current Scour Summary Sheet

Scour Depths and Condition

SCOUR DEPTHS					
<input type="checkbox"/> Scour depths are measured from the as-built channel profile.					
<input type="checkbox"/> Scour depths are measured from: <input type="text"/>					
Abutment or Bent #	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Y _{ab} <input type="checkbox"/> or Y _{ar} <input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Y _{al}	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Max Allowable Scour Depth ¹ , y _a	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Max Possible Scour Depth ²	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Calculated Contraction Scour	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Calculated Pier Scour	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total Calculated Scour Depth	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Observed Scour Depth	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Notes: (1) Min (y _{ar} or y _{ab} or y _{al}). (2) ONLY applicable if a non-erodible stratum is present.					
Abutment Protection Condition: None or Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Major <input type="checkbox"/> B.C.09 Channel Condition Rating: <input type="text"/>					
Refer to Fig. 8-2 of the TxDOT Scour Evaluation Guide.					
<input type="text"/>					

Verify:

- ✓ Reference all scour depths to the same unchanged datum
- ✓ Y_{ab} for non-erodible vs Y_{ar} for erodible. If Y_{ar} is used, provide max possible scour depth (Y_{mp}).
- ✓ Calculated scour depths from scour analysis results (e.g. contraction scour, pier scour, and total scour)
- ✓ List observed scour depth
- ✓ Abutment scour condition
- ✓ Channel condition



Example: Current Scour Summary Sheet Scour Depths Cont.

SCOUR DEPTHS		
<input checked="" type="checkbox"/> Scour depths are measured from the as-built channel profile.		
<input type="checkbox"/> Scour depths are measured from: _____		
Abutment or Bent #	Bent 2	Abut 1
y_{ab} <input checked="" type="checkbox"/> or y_{ar} <input type="checkbox"/>	15	
y_{al}	25	
Max Allowable Scour Depth ¹ , y_a	15 (Elev. 200)	
Max Possible Scour Depth ²		See Trigger
Calculated Contraction Scour	5	
Calculated Pier Scour	2.5	
Total Calculated Scour Depth	7.5	
Observed Scour Depth	10 (Elev. 195)	See below
Notes: (1) Min (y_{ar} or y_{ab} , or y_{al}). (2) ONLY applicable if a non-erodible stratum is present.		
Abutment Protection Condition: (Describe below)	None or Minor <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Major <input type="checkbox"/>	B.C.09

Compare the observed and calculated scour depth to maximum allowable to suggest/change the scour coding.

- ✓ A good practice is input **both elevation and depth** to the most scour vulnerable bent(s)



Example: Current Scour Summary Sheet Trigger Elevation or Condition

Form 2605

(Rev. 03/24)

Page 3 of 3

TRIGGER ELEVATION & FUTURE ACTION

Refer to Chapter 10 of the Scour Evaluation Guide.

Current scour at abutment exposed toe wall of CRR. Considered moderate exposure condition.

Re-evaluation will be needed:

- When scour exposed the bottom of abutment cap
- When scour at Bent 2 exceeded 13 feet (Elev. 198')

- ✓ A good practice is input **both elevation and depth** to the most scour vulnerable bent(s)
- ✓ Trigger condition for scour at abutment

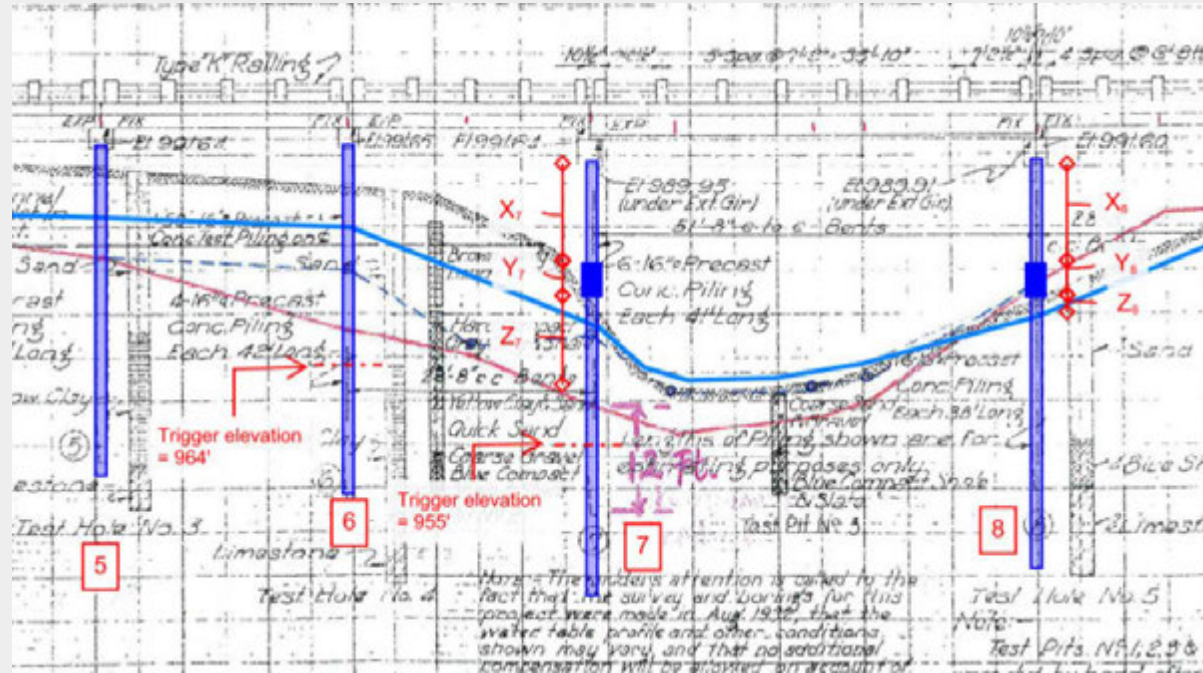
***When scour depth passes a trigger, the structure will need to be re-evaluated for scour**

Requirements for Scour Documentation



Trigger Elevation or Condition

- ✓ A good practice is to display trigger graphically, especially for scour critical bridges



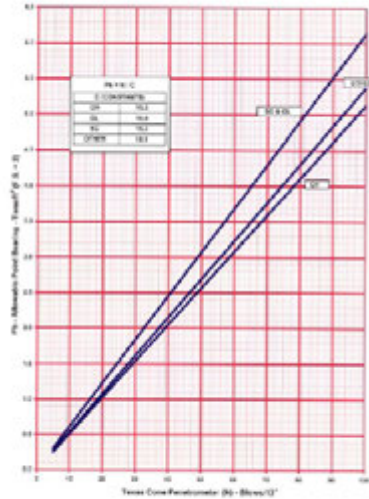
Requirements for Scour Documentation



Trigger Elevation or Condition

✓ Display trigger graphically, especially for scour critical bridges

Conservatively assumed the Shale is softer than 100 blows/12", see below Fig 5-2 in 2020 TxDOT Geotechnical Manual.



Allowable end bearing = 5.37 tsf

Conservatively neglect the contribution of underreamed flares, I take DS diameter = 24" or (27).

End bearing = $5.37 \times \pi \times 2^2 / 4 = 17$ tons.

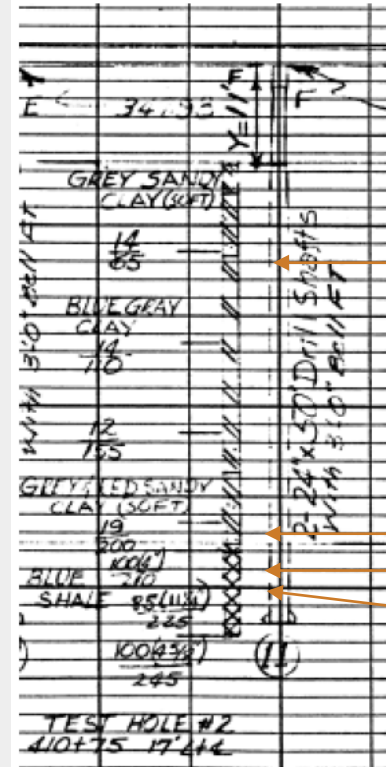
17 tons x 2 (F.S.) = 34 tons

When scour reach elev 292' (about 1 to 2D above the tip) for Bents 4 to 7, F.S. for vertical capacity = 34 tons/30 tons = 1.1.

Therefore, recommended scour rating for Y_{sc} ONLY:

- Item 113 = 4 for now
- Item 113 = 3 when scour reach 296' (the top of shale layer)
- Item 113 = 2 when scour reach 292' (re-evaluate scour impact for the bridge).
- Item 113 = 1 when scour reach 290' or when the top of underream exposed.

Figure 5-2. Allowable Point Bearing (TCP When Softer than 100 Blows/12 in.)



Current Scour 10'

When Scour reached:

296' Item 113 = 3

292' Item 113 = 2

290' Item 113 = 1

*When Scour Coding/Condition change, a new scour evaluation should be uploaded to AssetWise



Supporting Documents

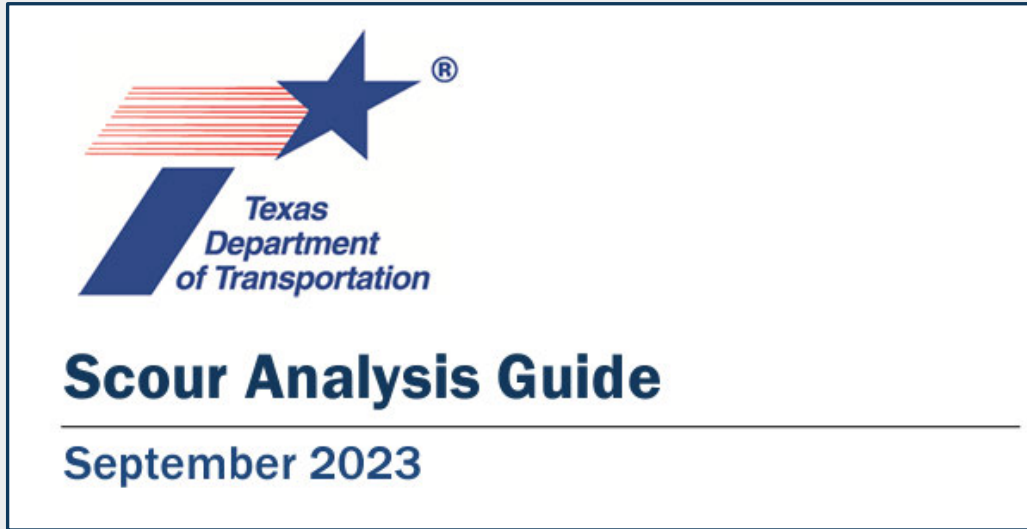


New Span Bridges Over Water

Form 2605 (SSS) + **Scour Analysis**



Scour Analysis Reporting



<https://ftp.txdot.gov/pub/txdot-info/des/guides/scour-guide.pdf>

***Report should include enough information to defend the chosen methodology and reproduce the results**



Scour Analysis Reporting for old or new span bridges

Report must be signed and sealed by a PE

- ✓ Site Investigation
- ✓ Hydrologic method(s) and details
- ✓ Channel cross section and site description
- ✓ Hydraulic method(s) and assumptions
- ✓ Soil condition near the bridge
- ✓ Scour calculations (methods, summary of calculations, and summary tables for showing contraction, pier, and total scour depths)

Information to be needed
in scour summary sheet



***Report should include enough information to defend the chosen methodology and reproduce the results**



Bridge Scour Data Sheet



<https://ftp.txdot.gov/pub/txdot-info/brg/design/bridge-detailing-guide.pdf>



Bridge Scour Data Sheet for new span bridges

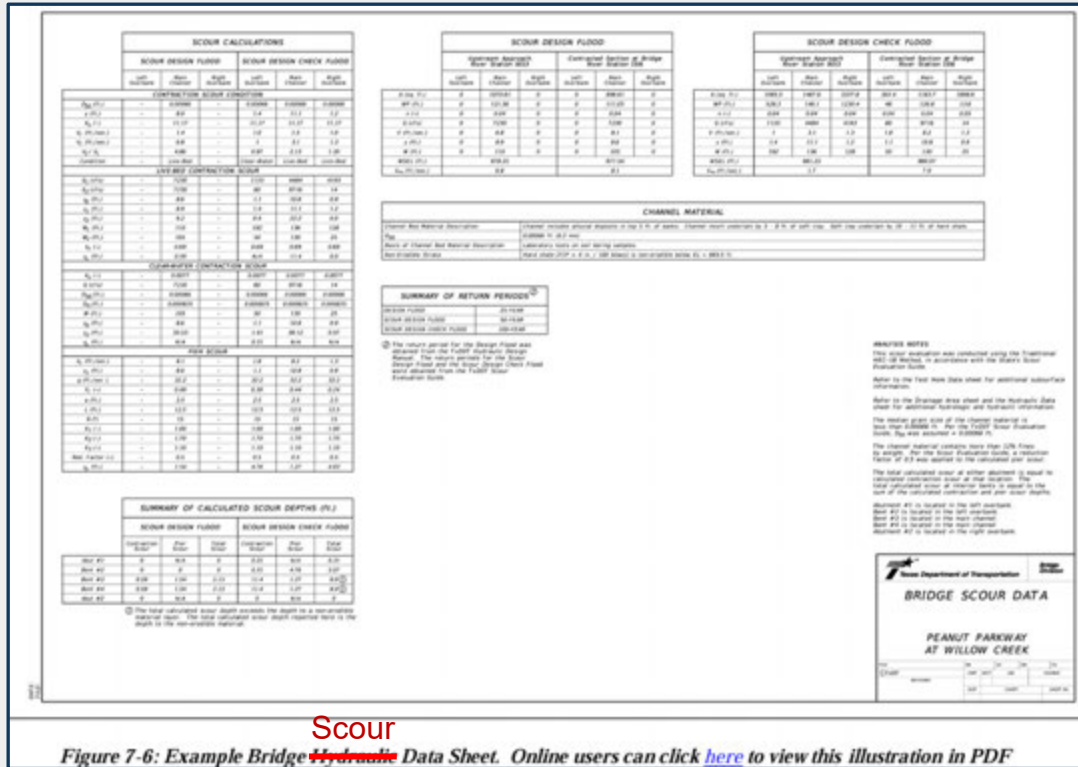
- A summary of scour analysis in plan sheet
- Do not include scour depths on the bridge layout
- Refer to checklist in the bridge detailing guide

Bridge Scour Data Sheet Checklist (Click [here](#) for PDF.)

- Return period for the Design Flood.
- Return period for the Scour Design Flood.
- Return period for the Scour Design Check Flood.
- Peak flow data for the Scour Design Flood in the left overbank, main channel, and right overbank; peak flow data must be provided for one cross section upstream of the bridge and one cross section in the contracted section. At a minimum, peak flow data must include discharge, velocity, and water surface elevation.
- Peak flow data for the Scour Design Check Flood in the left overbank, main channel, and right overbank; peak flow data must be provided for one cross section upstream of the bridge and one cross section in the contracted section. At a minimum, peak flow data must include discharge, velocity, and water surface elevation.
- River Stations for the “upstream” and “contracted section” cross sections.
- Description of channel material (e.g., D_{50} , USCS classification, etc.).
- Basis of channel bed material description (e.g., laboratory tests, boring logs, etc.)
- Identification of non-erodible subsurface layer(s), or a statement indicating that no such layers are present.
- Identification of scour evaluation method used.
- Summary of values and units for all equation variables.
- Location of each abutment and bent (i.e., left overbank, main channel, or right overbank).
- Summary of calculated scour depths, for the Scour Design Flood and Scour Design Check Flood, at each abutment and bent.



Bridge Scour Data Sheet for new span bridges



Scour

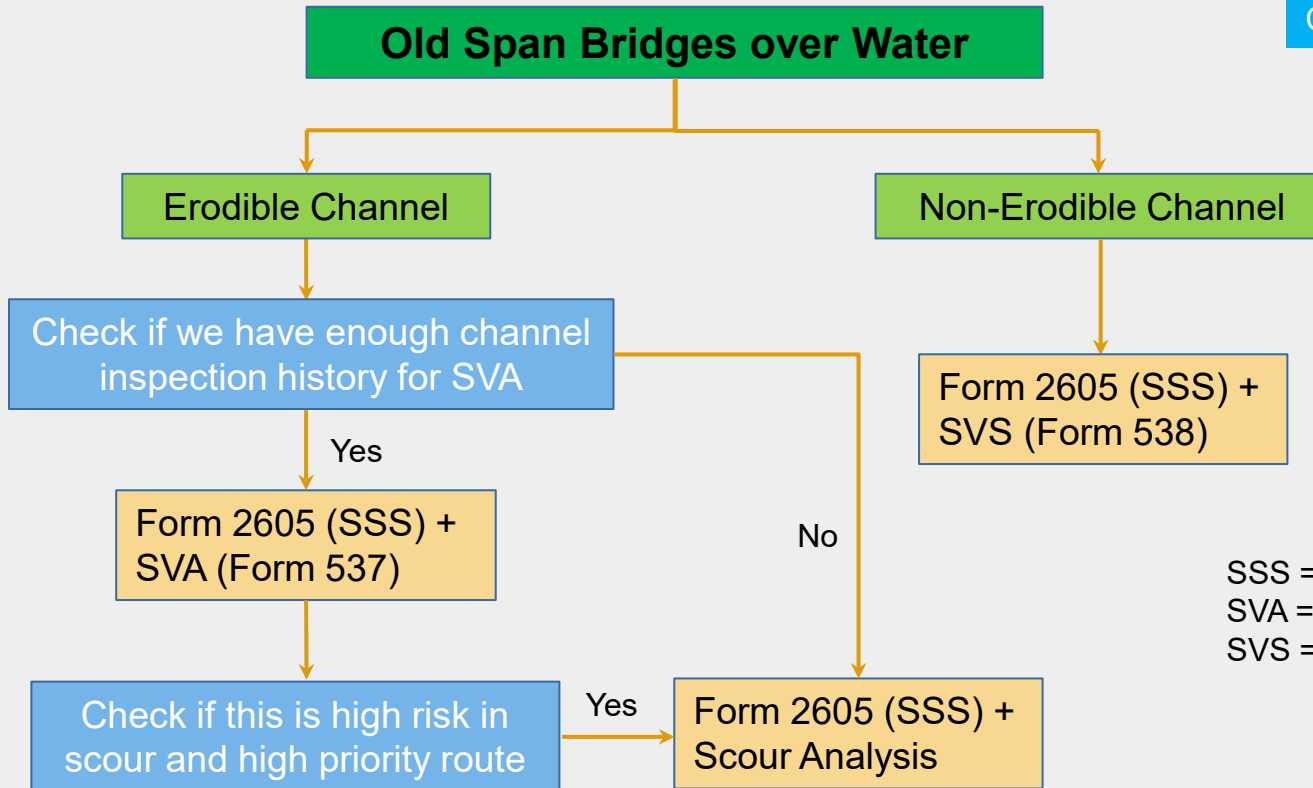
Figure 7-6: Example Bridge Scour Data Sheet. Online users can click [here](#) to view this illustration in PDF



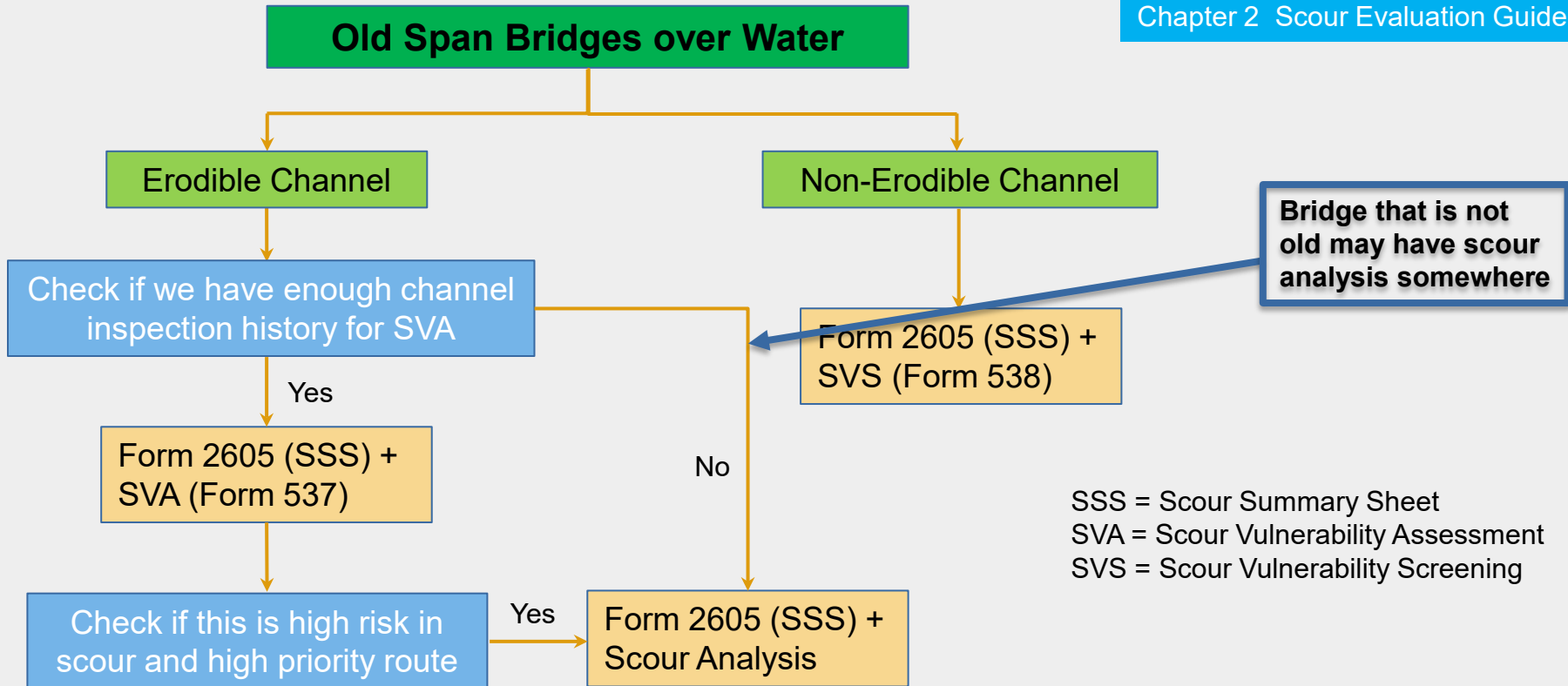
Old Span Bridges over Water

Form 2605 (SSS) + 1 of below:

- SVA (for erodible)**
- SVS (for non-erodible or lined channel)**
- Scour Analysis (for high risk)**



SSS = Scour Summary Sheet
SVA = Scour Vulnerability Assessment
SVS = Scour Vulnerability Screening





SVS vs SVA

3 of the Scour Evaluation Guide):

Drilled Shaft Trestle Pile

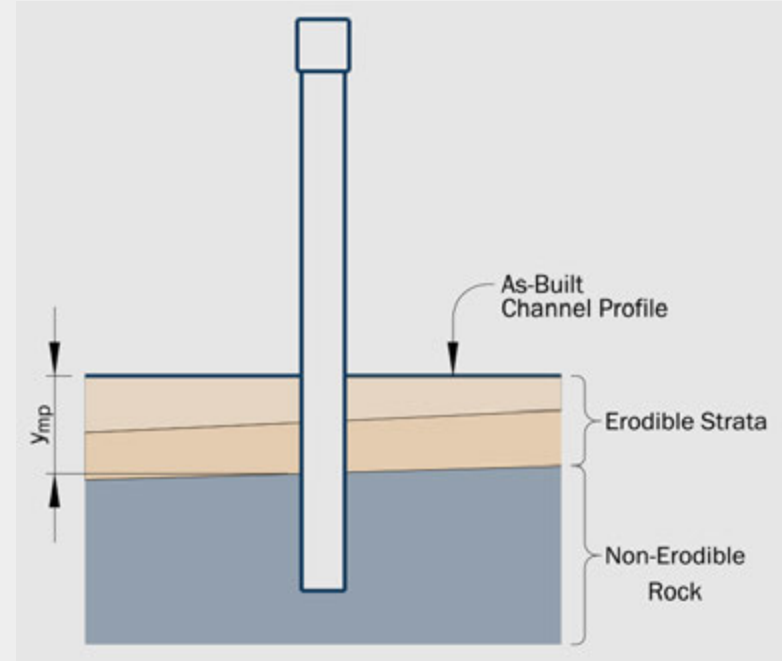
otation (y_{ar}) = ft.

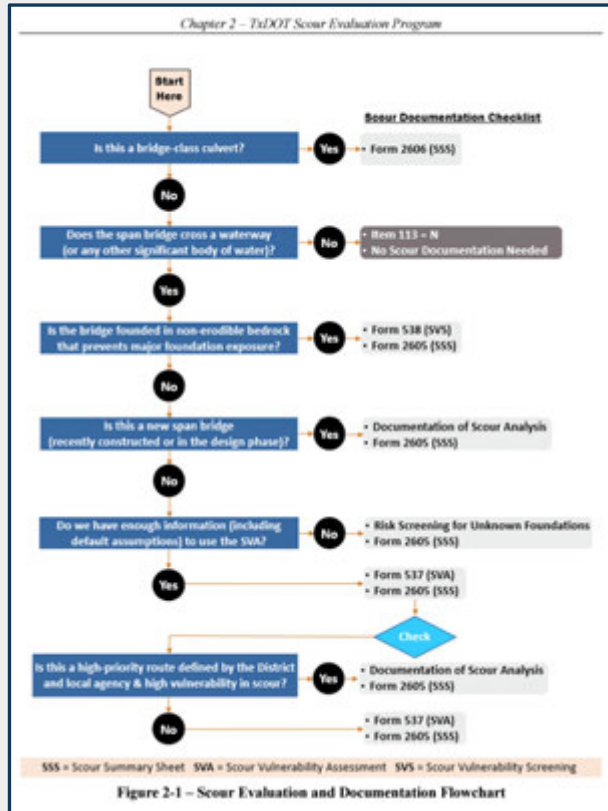
nbraced Length (y_{al}) = ft.

: $\text{Min}(y_{ar}, y_{al}) =$ ft.

y_{mp} / y_a	Recommended Item 113 Coding	Recommended Item B.C.11 Coding
0 - 0.5	8	6,7,8,9
0.5 - 0.75	4 (if $y_s = y_{mp}$) or 5 (if $y_s < y_{mp}$)	5
0.75 - 1.0	Use SVA Form 537	

Compare y_{mp} and y_a





<https://crossroads/content/dam/crossroads/divisions/bridge/documents/field-operations/scour-forms-guides/txdot-scour-evaluation-guide-07-21-2023.pdf>



Scour Website

The screenshot shows the CROSSROADS website interface. At the top, it says 'CROSSROADS'. Below that, there's a breadcrumb trail: 'Divisions / Bridge Division / Sections / Field Operations section'. The main heading is 'Scour forms and guidance'. Underneath, it says 'Stone riprap sizing' with a link to 'Stone Riprap Sizing Spreadsheet'. The 'Scour forms' section lists several forms with links to guides:

- Form 537 – Scour Vulnerability Assessment | Guide
- Form 538 – Scour Vulnerability Screening | Guide
- Form 2605 – Scour Summary Sheet for Span Bridges | Guide
- Form 2606 – Scour Summary Sheet for Bridge-Class Culverts | Guide
- Form 2609 – Bridge Scour Plan of Action (Item 113 = 1) | Guide
- Form 2624 – Bridge Scour Plan of Action (Item 113 = 2) | Guide
- Form 2604 – Bridge Scour Plan of Action (Item 113 = 3) | Guide
- Form 2607 – Plan of Action Follow-Up

<https://crossroads/divisions/brg/sections/field-operations-section/scour-forms-and-guidance.html>

The screenshot shows the Texas Department of Transportation website page for 'Bridge forms'. The page title is 'Bridge forms' and it includes a search bar. Below the search bar is a table of frequently asked questions regarding forms. The table has two columns: 'No.' and 'Title'. Blue arrows point to specific rows in the table:

No. #	Title #
513	↳ Sillion List
537	↳ Scour Vulnerability Assessment ←
538	↳ Scour Vulnerability Screening ←
10804	↳ Recommended Changes to Bridge Load Position
2238	↳ Bridge Structure Condition History
2242	↳ Options to Bridge Inspection Record
2244	↳ Summary of Tracked Load Position Interests
2252	↳ Information Sheet for Structural Design
2488	↳ Information Sheet for Bridge Rating Livestock, Benefits & Risks
2495	↳ Bridge Load Rating Database
2596	↳ TDOT Critical Cracks Follow-Up/Investigation - Off-System
2597	↳ TDOT Critical Cracks Follow-Up/Investigation - On-System
2598	↳ TDOT Bridge Cracks Critical Inspection Findings (CAF)
2600	↳ Channel Cross Section Measurements Record
2601	↳ Under Clearance Record
2602	↳ Bridge Summary Sheet
2604	↳ Bridge Scour Plan of Action Item 113-2
2605	↳ Scour Summary Sheet for Span Bridges ←
2606	↳ Scour Summary Sheet for Bridge Class Culverts ←
2607	↳ Plan of Action Follow-Up
2609	↳ Bridge Scour Plan of Action Item 113-1

<https://www.txdot.gov/business/resources/highway/bridge/bridge-forms.html>



Updating Superseded Scour Documentation



What warrants an update to scour documentation?

- ✓ Scour coding changed due to
 - Scour depth meets or exceeds a trigger
 - Evaluation method has changed
- ✓ Foundation is now known for unknown foundation
- ✓ Bridge is widened (it is a new bridge)
- ✓ Scour condition change due to
 - Designed countermeasure installed
 - Scour problem re-appears in a different bent or abutment



Acceptable scour documentation after July 2020

- Scour Evaluation based on Screening
 - Scour Vulnerability Screening ([Form 538](#))
 - Risk Screening for Unknown Foundations (Only applicable to NBI Item 113)
 - TxDOT Secondary Screening Report*
- Scour Evaluation based on Assessment
 - Scour Vulnerability Assessment Form ([Form 537](#))
 - TxDOT Secondary Scour Evaluation Report*
- Scour Evaluation based on Analysis
 - Detailed Report for Scour Evaluations based on Analysis
 - Bridge Hydraulic Data Sheet with Scour Calculations
 - TxDOT Simplified Scour Method Summary*
 - TxDOT Concise Analysis Report*
 - Bridge Layout Showing Calculated Scour Depths*

Methods marked with an asterisk (*) are no longer permitted for new scour evaluations, but remain valid for scour evaluations conducted prior to June 1, 2020. In general, scour evaluations remain valid for as long as the conditions assumed for the evaluation remain accurate.

Scour evaluation remains valid

- ✓ The required scour information can be found
- ✓ Evaluation supports the current coding
- ✓ Method(s) of evaluation is accurate and can be traced
- ✓ Sign and seal of an EOR and date of assessment can be traced

Texas Secondary Evaluation and Analysis for Scour



Texas Department of Transportation Texas Secondary Evaluation and Analysis for Scour

Secondary Scour Evaluation

District	[REDACTED]	County	[REDACTED]
Bridge No.	[REDACTED]	Highway	[REDACTED]
Crossing	[REDACTED]	SVEAR	

1. FOUNDATION SET IN NONERODIBLE ROCK:

Is the foundation embedded at least one shaft diameter into nonerodible rock (if spread footing at least 3 inches embedment)?

___ No. The foundation is not embedded in nonerodible rock. Continue with question 2.

___ Yes. The foundation is embedded in sound, nonerodible rock. Complete the following table to determine if the unsupported length of the critical support is stable.

Pile Type	Concrete Drilled Shaft Pile/Pier # 1	Concrete Drilled Shaft Pile/Pier # 2	Concrete Drilled Shaft Pile/Pier # 3	Concrete Drilled Shaft Pile/Pier # 4
A. Diameter or width (inches)	24"	24"	24"	24"
B. Approximate stability limit	1.5	1.5	1.5	1.5
C. Allowable unsupported length	36	36	36	36
D. Unsupported length (ft)	45.14	45.81	45.81	46.14

Recommended Action	Item 113 (D)	Item 113.1
<input checked="" type="checkbox"/> No further action required	8	E
<input checked="" type="checkbox"/> Analyze unsupported length of supports	5	9 (9)

(1) Code item 113 a 4, 5, or 8 according to the BRINSAP coding guide.
 (2) Leave item 113.1 unchanged pending results of structural analysis.
 • If yes and unsupported length stable, stop here after checking recommended action above.

Note: Attach Bridge Layout sheets and additional applicable drawings.

[REDACTED SIGNATURE]

12-30-02 Date

× Date of assessment is about 10 years ago

File Name: [REDACTED] Scour_2002-12.pdf
 File Date: 06/08/2021
 Description:
 Linked Fields:

Delete

× No other supporting document found to support current coding

File Name: [REDACTED] File Description: [REDACTED] Category: [REDACTED]

Inspector (S): [REDACTED]

Inspector (R): [REDACTED]

Bridge (S): [REDACTED]

Bridge (R): [REDACTED]

File Name: [REDACTED] File Description: [REDACTED] Category: [REDACTED]

Inspector (S): [REDACTED]

Inspector (R): [REDACTED]

Bridge (S): [REDACTED]

Bridge (R): [REDACTED]

× Previous coding no longer applies

× Inspection is likely not current



Texas Department of Transportation Texas Secondary Evaluation and Analysis for Scour

Secondary Scour Evaluation

District	[REDACTED]	County	[REDACTED]
Bridge No.	[REDACTED]	Highway	[REDACTED]
Crossing	[REDACTED]	SVEAR	

1. FOUNDATION SET IN NONERODIBLE ROCK:

In the foundation embedded at least one shaft diameter into nonerodible rock (if spread footing at least 3 inches embedment)?

No. The foundation is not embedded in nonerodible rock. Continue with question 2.

Yes. The foundation is embedded in sound, nonerodible rock. Complete the following table to determine if the unsupported length of the critical support is stable.

Pile Type	Concrete Drilled Shaft Pile/Pier # 1	Concrete Drilled Shaft Pile/Pier # 2	Concrete Drilled Shaft Pile/Pier # 3	Concrete Drilled Shaft Pile/Pier # 4
A. Diameter or width (inches)	24"	24"	24"	24"
B. Approximate stability limit	1.5	1.5	1.5	1.5
C. Allowable unsupported length	36	36	36	36
D. Unsupported length (ft)	45.14	45.81	45.81	46.14

<input checked="" type="checkbox"/> Recommended Action		Item 113 (D)	Item 113.1
<input type="checkbox"/> No further action required	unsupported length, $D \leq C$	B	E
<input checked="" type="checkbox"/> Analyze unsupported length of supports	unsupported length, $D > C$	5	Q (2)

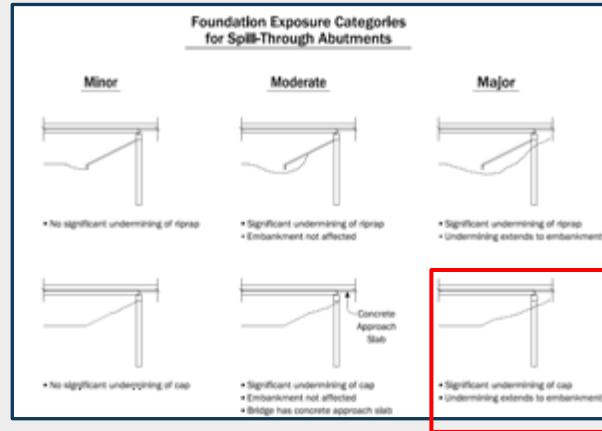
(1) Code item 113.1 a 4, 5, or 8 according to the BRINSAP coding guide.
 (2) Leave item 113.1 unchanged pending results of structural analysis.
 • If yes and unsupported length stable, stop here after checking recommended action above.

Note: Attach Bridge Layout sheets and additional applicable drawings.

Needs Analysis

12-30-02
Date

- × Previous assessment did not include scour around the abutment and its trigger for future action





Storing, Updating, and Tracking Scour Documentation



Review and Tracking of Scour Documentation

- Monthly Scour Report or future Dashboard
 - Identify Item 113 =6
 - Identify Item 113.1 = Blank
- List of Structures (LOS) Spreadsheet in Scour Tab
 - Identify Item 113 =6
 - Identify Item 113 \neq 6 but missing scour evaluation
 - Scour documentation does not support current Item 113 coding
 - Scour Critical Bridges
 - Missing Scour POA (for both 113.1=Blank and 113.1 = P but no POA)
- QC Folder in AssetWise

Requirements for Scour Documentation



Monthly Scour Report Tracks Missing Scour Documentation

02-15-2024	Missing Scour Evaluation (NBI Item 113 = 6)						District Totals	Unknown Foundation in District Total
	Span Bridges			Culverts				
	Age < 5 years	Age ≥ 5 years	Dist. Subtotal	Age < 5 years	Age ≥ 5 years	Dist. Subtotal		
	6	1722	1728	2	795	797	2525	406
	14	1243	1257	10	531	541	1798	333
	21	331	352	7	750	757	1109	37
	2	460	462	2	416	418	880	1
	3	422	425	1	344	345	770	6
	0	57	57	0	498	498	555	0
	0	47	47	1	448	449	496	15
	0	227	227	0	225	225	452	8
	7	143	150	0	273	273	423	78
	2	153	155	0	230	230	385	4
	0	130	130	2	221	223	353	25
	9	90	99	2	163	171	270	9
	2	108	110	1	128	129	239	3
	0	174	174	5	17	22	196	22
	2	74	76	0	100	100	176	19
	3	149	152	1	8	9	161	26
	7	50	57	2	98	100	157	4
	1	136	137	0	12	12	149	19
	0	35	35	0	62	62	97	0
	0	0	0	0	92	92	92	0
	0	0	0	0	16	16	16	0
	0	11	11	1	1	2	13	4
	0	6	6	0	0	0	6	4
	0	2	2	0	0	0	2	0
	0	0	0	0	0	0	0	0
Subtotals	79	5770	5849	37	5434	5471		1023
Statewide Total	11320							

BRG is preparing scour documentation for bridges with unknown foundations

Identify Item 113 = 6

Identify Item 113.1 = Blank



Monthly Scour Report - Monthly Audit



Scour Query Instruction Guide

Bridge Division – Field Operations
1/30/2024

Before Scour Report Each Month

- File query scour evaluation and compare to the coding (Item 113 ≠ N)
- File query scour POA and compare to the coding (Item 113.1 = P)

https://crossroads/content/dam/crossroads/divisions/bridge/documents/field-operations/scour-forms-guides/scour_query_instruction_guide.pdf

Requirements for Scour Documentation



Monthly Scour Report Tracks Missing Scour Documentation or POA

17 - Bryan	0	6	6	0	0	0	6	4	23 - Brownwood	0	0	0	0	0	0	0	0
02 - Fort Worth	0	2	2	0	0	0	2	0	04 - El Paso	0	0	0	0	0	0	0	0
05 - Atlanta	0	0	0	0	0	0	0	0	05 - Dallas	0	0	0	0	0	0	0	0
Subtotals	73	5770	5849	37	5434	5471		1023	Subtotals	0	48	48	0	0	0	0	0
Statewide Total	11320								Statewide Total	48							

BRG is preparing scour documentation for bridges with unknown foundations

FTW WFS AMA LBB ODA SJT ABL WAC TYL LFK HOU YKM AUS SAT CRP BRY DAL

15-Feb-2024 Missing Scour Evaluations (NBI Item 113 = 6)

NBI 009 Structure Num	NBI 007 Facility Carried	NBI 006 Feature Intersected	NBI 027 Year Built	NBI 90 Inspection Da	NBI 062 Culverts	NBI 113 Scour Critical Bl	NBI 113.1 Scour PG	NBI 113.2 Unkn FC
110030017602083	BUS 53	HURRICANE CREEK	1943	05/26/2022	6	6		
110030017603058	US 59	MCCALL CREEK	1947	05/25/2022	6	6		
110030019594012	US 69	MULBERRY BRANCH	1924	05/30/2022	6	6		
110030020001056	US 69	BLISS BRANCH	1943	05/24/2022	6	6		
110030020002332	US 69 NB	Wierlands 1	2022	06/25/2022	N	6		
110030024401003	SH 63	MILL CREEK	1925	05/25/2022	5	6		
110030024401057	SH 63	BIG CREEK	1960	05/25/2022	6	6		
110030019594043	SH 94	JACK CREEK RELIEF	1933	05/27/2022	6	6		
110030019594049	SH 94	CEGAR CREEK	1951	05/27/2022	6	6		
110030019594061	SH 94	JACK CREEK TRIBUTARY	1983	05/27/2022	7	6		
110030019594063	SH 94	JACK CREEK TRIBUTARY	1988	05/27/2022	7	6		
110030019594065	SH 94	NECHES RIVER	2012	05/27/2022	N	6		
110030033603009	SH 103	JACK CREEK TRIBUTARY	1939	05/27/2022	7	6		
110030033603010	SH 103	JACK CREEK	1939	05/26/2022	6	6		
110030033603012	SH 103	RO-VAN CREEK	1941	05/27/2022	6	6		
110030039003035	SH 147	ROCKY CREEK	1937	05/25/2022	6	6		
110030057602001	FM 58	HURRICANE CREEK TRIB	1938	05/19/2022	7	6		
110030057602007	FM 58	STOVALL CREEK	1985	05/23/2022	6	6		
110030057602008	FM 1918	BEAR CREEK	1985	05/23/2022	7	6		
110030057602009	FM 1918	WHITE OAK CREEK	2009	05/23/2022	N	6		
110030089304012	FM 328	TUBBS CREEK	1987	05/26/2022	7	6		
110030089401004	SH 7	JORDAN BRANCH	1961	05/28/2022	7	6		
110030089401005	SH 7	WATSON BRANCH	1961	05/28/2022	6	6		
110030106401002	FM 843	PROCELLA CREEK	1987	05/26/2022	7	6		
110030106501003	FM 842	PAPFR MILL BRANCH	1987	05/26/2022	7	6		

Requirements for Scour Documentation



Monthly Scour Report → Dashboard (Coming Soon)

Missing Scour Eval & POA | Right Detail Info | Missing Scour Evaluation Histo...

Missing Scour Evaluation (NBI Item 113 = 6)

District	#	Span Bridges			Culverts			Grand Total
		Age < 5 years	Age == 5 years	Total	Age < 5 years	Age == 5 years	Total	
Abernethy	0	0	307	307	0	0	307	
Amerillis	4	72	76	148	0	0	148	
Austin	9	42	51	93	1	0	94	
Beaumont	2	135	139	274	0	0	274	
Brownwood	3	47	50	97	1	0	98	
Bryan	0	3	3	6	0	0	6	
Corpus Christi	9	47	54	101	2	0	103	
Dallas	4	1,701	1,705	3,406	0	0	3,406	
El Paso	2	153	155	308	0	0	308	
Fort Worth	0	2	2	4	0	0	4	
Houston	13	1,293	1,296	2,589	10	0	2,599	
Laredo	0	10	10	20	1	0	21	
Lubbock	0	0	0	0	52	0	52	
Lufkin	6	133	139	272	0	0	272	
Odessa	0	35	35	70	0	0	70	
Paris	3	402	405	807	1	0	808	
Pharr	0	227	227	454	0	0	454	
San Angelo	0	55	55	110	0	0	110	
San Antonio	21	326	347	673	7	0	680	
Tyler	0	158	158	316	8	0	324	
Waco	4	128	132	260	1	0	261	
Wichita Falls	0	458	458	916	0	0	916	
Ysuum	0	132	132	264	0	0	264	
Grand Total	76	5,647	5,740	11,387	29	0	11,416	

Missing Scour POA (NBI Item 113 < 4 and Item 113.1 ≠ P)

District	Span Bridges		Culverts		Grand Total
	Age < 5 years	Total	Age < 5 years	Total	
Amerillis	13	13	0	0	13
Beaumont	1	1	0	0	1
Corpus Christi	1	1	0	0	1
Dallas	6	6	0	0	6
Houston	9	9	0	0	9
Laredo	2	2	0	0	2
Lufkin	12	12	0	0	12
Paris	1	1	0	0	1
San Antonio	4	4	0	0	4
Waco	1	1	0	0	1
Grand Total	54	54	0	0	54

Unknown Foundation Missing Scour Evaluation

District	
Dallas	406
Houston	330
Lufkin	68
San Antonio	36
Ysuum	25
Amerillis	17
Waco	6
Tyler	4
Paris	6
Beaumont	19
Brownwood	15
Austin	9
Pharr	9
Corpus Christi	4
Laredo	3
El Paso	4
Bryan	3
Wichita Falls	1
Abernethy	2
Grand Total	945

Last Update: 3/11/2024 9:53:15 AM

Summary Tab

Unknown Foundation is taken care by BRG

Zero count will not show up

Requirements for Scour Documentation



Monthly Scour Report → Dashboard
(Missing Scour Documentation, POA, and Unknown Foundations)

Missing Scour Eval & POA | Bridge Detail Info | Missing Scour Evaluation Histo...

Bridge Detail

Filter District and Data

Map: Oklahoma, Arkansas, Louisiana

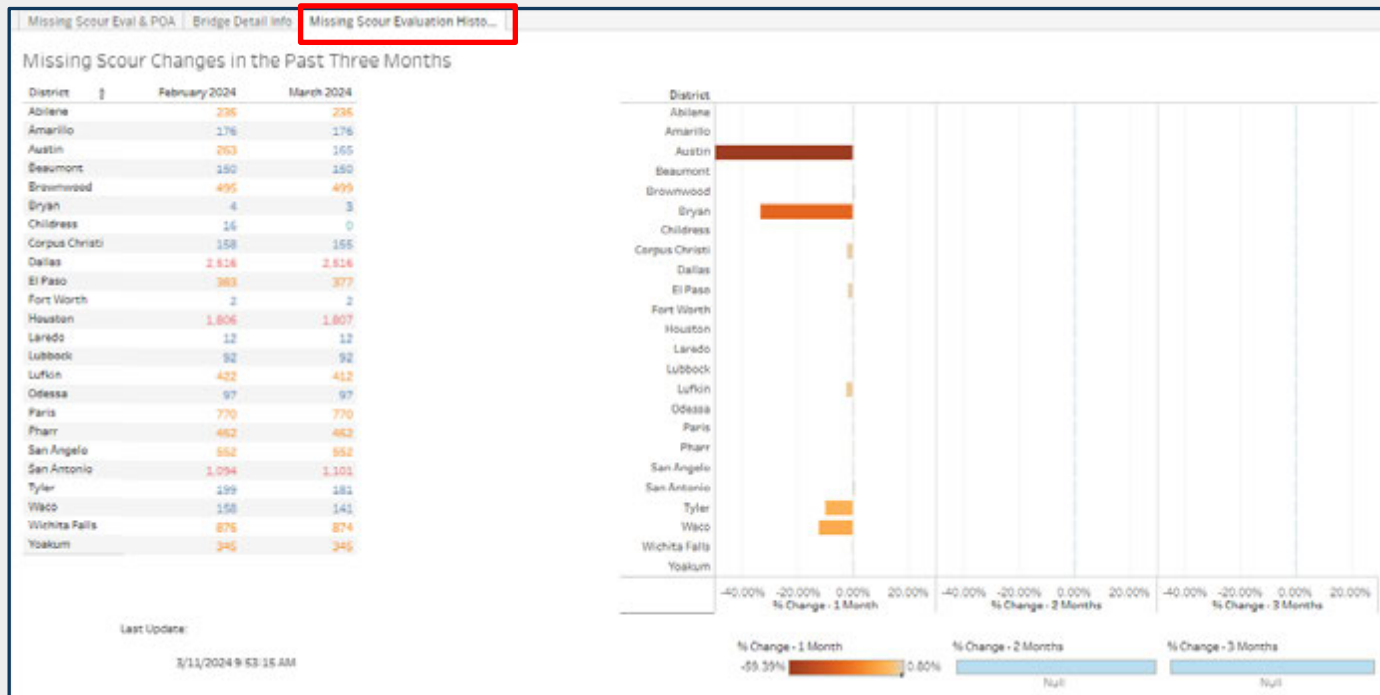
NBI	District	Facility Carried	Feature Crossed	Yr Built	Sub Rating	Culvert Rating	Channel Rating	Waterway Adequacy
010920AA0203002	Paris	WASHINGTON AVE	SAND CREEK	2011	6	5	7	8
010920AA0366001	Paris	CHAFFORD ROAD	TR-S OF B-G MINERAL ARM	2023	7	5	6	4
010920AA0369002	Paris	Shelmas Trail	Trio of Big Mineral Cr.	2022	6	5	5	6
010920AA0554001	Paris	O S GRONER RD	DRAW	1999	6	5	7	4
011190AA0596001	Paris	CR 4719	White Oak Creek	2001	6	5	5	8
011900AA0122001	Paris	CR 1402	Cedar Creek	2013	7	5	7	7
011900AA0243001	Paris	CR 2220	Sandy Creek	1992	5	7	6	6
011940AA0803001	Paris	CR 2127	SCATTER CREEK	2024	8	5	6	8
011940B00030002	Paris	S CEDAR ST	DELAWARE CREEK	2024	5	7	6	7
030050AA0107001	Wichita Falls	CR 107 / WELLS RD	HOLLIDAY CREEK	2008	7	5	8	8
030050AA0107002	Wichita Falls	CR 107 / WELLS RD	HOLLIDAY CREEK REBUI	1989	5	6	8	4
030050AA0117001	Wichita Falls	CR 117/MCMURTRY RD	W FK OF TRINITY RIVER	2006	6	5	6	7
030050AA0147001	Wichita Falls	CR 147 / SYMANK RD	KICKAPOO CREEK	2009	5	6	6	7
030050AA0156001	Wichita Falls	CR 156 / HARMEL RD	DBAW	2001	5	7	7	7
030050AA0156002	Wichita Falls	CR 156 / HARMEL RD	WAGON BR	2006	5	7	7	4
030050AA0161001	Wichita Falls	CR 161 / WINY RD	S FK LITTLE WICHITA R	2008	5	7	7	7
030050AA0161002	Wichita Falls	CR 161 / SPAIN RD	S FK LITTLE WICHITA R	2008	5	7	6	7
030050AA0161003	Wichita Falls	CR 161 / WINY RD	DRAW	2008	7	5	7	8
030050AA0166001	Wichita Falls	CR 166 / RIVER RD	S FK LITTLE WICHITA R	1996	7	5	6	8
030050AA0189001	Wichita Falls	CR 189 / TERRAPIN RD	MESQUITE CREEK	2001	5	7	6	7
030050AA0189002	Wichita Falls	CR 189 / FALLS CD RD	DRAW	2006	5	7	6	4
030050AA0189003	Wichita Falls	CR 189 / FALLS CD RD	MESQUITE CREEK	2008	5	7	6	3
030050AA0246003	Wichita Falls	CR 246 / BRITTON Lly	DRAW	2016	5	7	8	7
030050AA0282001	Wichita Falls	CR 282 / DECKER RD	PECAN CREEK REBUI	1987	5	7	7	9
030050AA0282002	Wichita Falls	CR 282 / DECKER RD	PECAN CREEK	1989	5	7	7	7
030050AA0328001	Wichita Falls	CR 328 / S LAKE RD	N FK LITTLE WICHITA R	2003	7	5	8	7
030120AA0113001	Wichita Falls	CR 113 / MOSS RD	TR-S BRIER CREEK	2015	8	5	8	4
030120AA0143001	Wichita Falls	CR 143/SIGN CR 435	880 CREEK	1942	6	5	6	4
030120AA0147001	Wichita Falls	CR 147 / CR 435E	LAKE CREEK	2016	6	5	7	7
030120AA0237001	Wichita Falls	CR 237 / BROM RD	COCKERELL CR	2010	5	7	7	7
030120AA0243001	Wichita Falls	CR 243 - YOUNG RD	MAHLE CREEK	2015	8	5	7	7
030120AA0246001	Wichita Falls	CR 246/JIM TOWNS RD	COOL CREEK	1949	5	4	4	7
030120AA0249001	Wichita Falls	CR 249/SIGN CR 450	DRAW	2020	5	7	8	4
030390AA0206001	Wichita Falls	CR 206/NEVILLE RD	DRY FK LTL WICHITA RIVER	2013	5	6	5	6
030390AA0276001	Wichita Falls	CR 296/LOVE STAR	E FK LITTLE WICHITA RIV	2004	5	7	5	6
030390AA0306001	Wichita Falls	CR 306/THAXTON RD	DRY FK LITTLE WICHITA RV	2004	5	7	6	7

Detail Tab

Requirements for Scour Documentation



Monthly Scour Report → Dashboard (Missing Scour Documentation)



History Tab

Requirements for Scour Documentation



Keep track of the scour condition and scour documentation.

Scour tab under the LOS spreadsheet from inspection contract

Facility Carried	Features Carried	Current Coding			Scour Critical (Y/N)	Missing Documents (Y/N/A)			Change in Site Condition Since Last SSS Compiled (Y/N)	New Scour Summary Sheet or Scour Evaluation Needed (Y/N)	Comments
		Item 111	Item 111.1	Item 111.2		Scour Analysis (Y)	Scour Summary Sheet (SSS)	Scour PDA			
OLD #1000714 RD	HKCD DITCH 0034-00-00										Scour/Plan/Photo Assessment
COLEMAN RD	DRAINAGE DITCH										Scour/Plan/Photo Assessment
W LAKE HOU PERCY BR	BENE BRANCH										Scour/Plan/Photo Assessment
W LAKE HOU PERCY BR	BENE BRANCH										Scour/Plan/Photo Assessment
MADONIA POINT DR	HKCD DITCH										Scour/Plan/Photo Assessment
MADONIA POINT DR	HKCD DITCH 1102-00-00										Scour/Plan/Photo Assessment
NEUMAN RD	DRAINAGE DITCH										Scour/Plan/Photo Assessment
MORNING STAR RD	JOSIAS BRANCH										Scour/Plan/Photo Assessment
SHORELANDS DR	HKCD DITCH 1102-00-00										Scour/Plan/Photo Assessment
WINDY LAKE	HKCD 1102-00-00										Scour/Plan/Photo Assessment
W 1 POINT ON HWY 68	LAKE PROTECT										Scour/Plan/Photo Assessment
W TOWNERS BLVD 18	HKCD DITCH										Scour/Plan/Photo Assessment
W TOWNERS BLVD 18	HKCD DITCH										Scour/Plan/Photo Assessment
FL RD 208	CAMEL CREEK										Scour/Plan/Photo Assessment
DRUS JOHNSON RD	LAKE LEXER										Scour/Plan/Photo Assessment
MOUNT SABA-A RD	LAKE CREEK										Scour/Plan/Photo Assessment
WINDMILL CREEK DR	WINDMILL CREEK										Scour/Plan/Photo Assessment
W ALDEN BRIDGE DR	DRAINAGE DITCH										Scour/Plan/Photo Assessment
W BRANCH CROSSLING	DRAINAGE DITCH										Scour/Plan/Photo Assessment
WOODLAND PARK	SPRING CREEK TRIBUTARY										Scour/Plan/Photo Assessment
WOODLAND PARK	SPRING CREEK TRIBUTARY										Scour/Plan/Photo Assessment
GRACE CREEK DR	GRACE BRANCH										Scour/Plan/Photo Assessment
DECKER HOSPITAL	WINDY CREEK										Scour/Plan/Photo Assessment
HANSEN WOODS DR	WINDY LAKE										Scour/Plan/Photo Assessment
HIGHLAND BLVD	DEY CREEK										Scour/Plan/Photo Assessment
HIGHLAND BLVD	DEY CREEK 46-00										Scour/Plan/Photo Assessment
BRANCH CROSSLING	SPRING CREEK TRIBUTARY										Scour/Plan/Photo Assessment
CRUICKSON RD	STEWARTS CREEK										Scour/Plan/Photo Assessment
Palmer Lane Dr	BRIDGE CREEK										Home Vulnerability Assessment
High Valley Dr	BRIDGE CREEK										Home Vulnerability Assessment
Clare Valley Dr	HKCD Ditch 0111-00-00										Home Vulnerability Assessment
Maple Branch Dr	HKCD Ditch 0111-00-00										Home Vulnerability Assessment
DEER PATH LN	BRANNAKE DITCH										Home Summary Sheet for Bridge Class Culverts
FLINTS CREEK DR	BRANNAKE DITCH										Home Summary Sheet for Bridge Class Culverts
FLINTS CREEK DR	BRANNAKE DITCH										Home Summary Sheet for Bridge Class Culverts
FLINTS CREEK DR	BRANNAKE DITCH										Home Summary Sheet for Bridge Class Culverts
FLINTS CREEK DR	BRANNAKE DITCH										Home Summary Sheet for Bridge Class Culverts
FLINTS CREEK DR	BRANNAKE DITCH										Home Summary Sheet for Bridge Class Culverts
FLINTS CREEK DR	BRANNAKE DITCH										Home Summary Sheet for Bridge Class Culverts

Page 1

More Comprehensive Tracking:

- ✓ Scour critical
- ✓ Missing scour documents
- ✓ Change in site condition
- ✓ New SSS or evaluation



QC Folder for Scour Documentation

SECTION 4 - NBI AND SCOUR DOCUMENTATION

Select "Yes" if the items listed below are included in the hard copy and electronic versions of the report and the data is accurate. Select "No" if one or more of the items listed below is missing/incomplete or inaccurate. If a "No" is selected, a comment is required listing the reason for each item that is substandard. If an item in the list does not apply to the structure you are reviewing, but all other paperwork is present and acceptable, select "Yes".

Prior to District Approval of Report, verified using the Report Tool "View Change Report" that updated asset values are consistent with photos/report and NBI coding guidelines

- Recommended changes to values consistent with inspection findings & cursory review of all Items Scour Documentation
- Verify that Items 113 & 113.1 are reflective of current conditions and contact Geotechnical Section for updates to coding if needed *

Scour Summary Sheet (SS&D) *

Identify other type of scour documentation in comments box for this section

Scour Critical Bridge (if Item 113 ≤ 3)

Scour Plan of Action (POA) is current *

Photos/documentation of temporary scour repairs if in place *

POA Follow-Up Form if POA was implemented *

Comments:

ext Description:(All assets and open reports where field 'QC Folder: NBI and Scour Documentation' = 'No')

Enter Query Criteria	<input checked="" type="checkbox"/> Add Criteria Field to Displayed Columns
Additional Filters	<input type="checkbox"/> Return results that match All of the following:
Select Display Columns	→ QC_Folder: NBI and Scour Documentation [=] No [🔍]
	Click to add a new criteria

Requirements for Scour Documentation



AssetWise Naming Convention

Bridge Attachments (PDFs) (In the Manager Files)	Various	File Driving Record	DD-CCC-CCCC-SS-SSS_FileRecord_YYYY
		Post-Construction Material Testing	DD-CCC-CCCC-SS-SSS_MaterialTest_YYYY-MM
		Scanned RT Insp Docs - 2012 and Prior (see Note 4)	DD-CCC-CCCC-SS-SSS_RTInsp_2012-YYYY
		Bridge Flood Assessment	DD-CCC-CCCC-SS-SSS_FloodAssess_YYYY-MM
		Original plans	DD-CCC-CCCC-SS-SSS_OrigPlans_YYYY
		Widening plans	DD-CCC-CCCC-SS-SSS_Widening_YYYY
		Rehabilitation Plans (reconstruction, etc.)	DD-CCC-CCCC-SS-SSS_Rehab_YYYY
		Scour Documentation (analysis, TSEAS, etc.)	DD-CCC-CCCC-SS-SSS_Scour_YYYY-MM
		Scour Plan of Action	DD-CCC-CCCC-SS-SSS_ScourPOA_YYYY-MM
		Scour Summary Sheet	DD-CCC-CCCC-SS-SSS_ScourSumSht_YYYY-MM
		Plan of Action Follow-Up	DD-CCC-CCCC-SS-SSS_POAFU_YYYY-MM
		Critical Finding Follow-Up	DD-CCC-CCCC-SS-SSS_CFFU_YYYY-MM
		Load Posting Photos	DD-CCC-CCCC-SS-SSS_LP_Photos_YYYY-MM
Bridge Closed Photos	DD-CCC-CCCC-SS-SSS_BrgClosed_Photos_YYYY-MM		
Bridge Design Notes and Calculations	DD-CCC-CCCC-SS-SSS_DN_YYYY-MM		

<https://ftp.txdot.gov/pub/txdot-info/brg/inspection/assetwise-attachment-naming-convention.pdf>

Requirements for Scour Documentation



Upload files to AssetWise under Bridge Attachment (pdf)

The screenshot illustrates the process of uploading files to AssetWise. On the left, a Windows File Explorer window shows a folder named 'Signed' containing three PDF files:

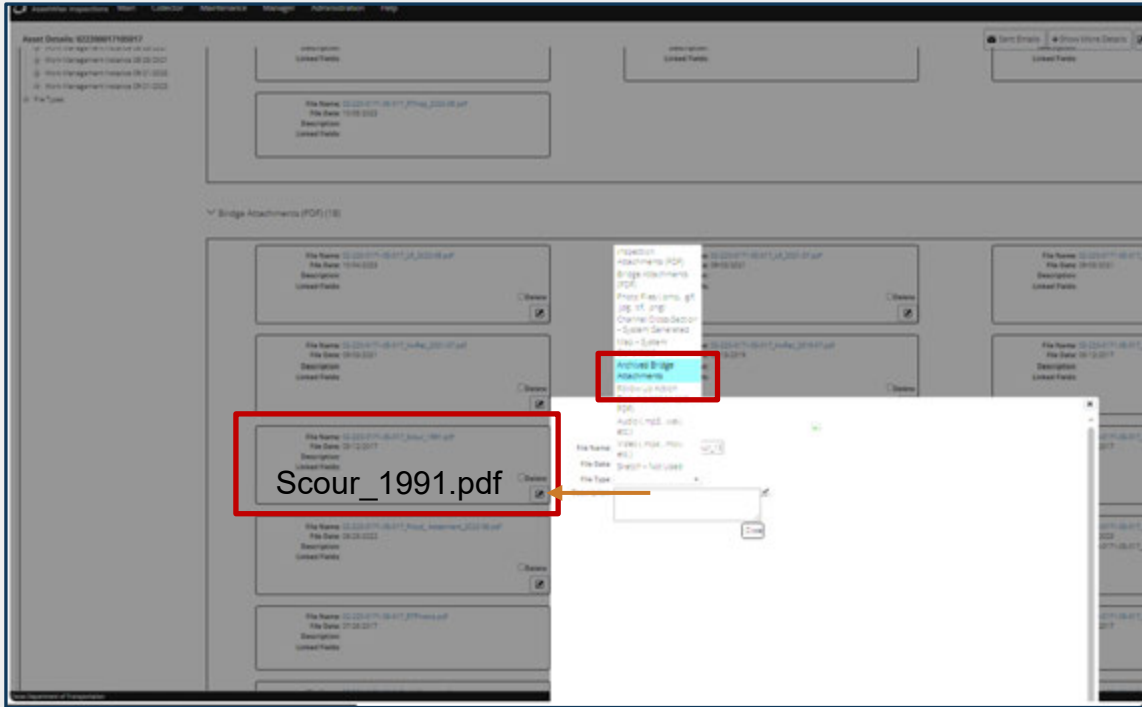
- 08-177-0264-01-004_Scour_2023-01.pdf
- 08-177-0264-01-004_ScourPOA_2023-01.pdf
- 08-177-0264-01-004_ScourSumSht_2023-01.pdf

On the right, the AssetWise 'Asset Details' page for asset ID 081770026401004 is shown. The 'Files' tab is active, and the 'Attach Picture/File' section is open. A dropdown menu is displayed, showing 'Bridge Attachments (PDF)' selected. Two orange arrows point from the selected files in the File Explorer to the 'Attach Picture/File' section in the AssetWise interface.

Requirements for Scour Documentation



Old scour document should move to “Archived Bridge Attachments”





Summary

- Adhere to scour documentation flowchart
- Make scour summary sheet a useful resource for inspection
- When scour conditions change, we need to update scour documentation
- Keep track of scour monthly report, LOS, and QC folder in AssetWise